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Research Article

Revision of the Afrotropical spider fly genus *Africaterphis* Schlinger, 1968 (Diptera, Acroceridae) with the description of a new species

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Abstract

The Afrotropical spider fly genus *Africaterphis* Schlinger, 1968 (Acroceridae, Philopotinae) is revised, including the description of *Africaterphis stefanfoordi* **sp. nov.**, bringing the total number of species in the genus to three.

Key words: Humpbacked flies, small headed flies, taxonomy

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Introduction

Acroceridae (Insecta, Diptera) are an enigmatic family of flies with more than 430 species globally, 65 of which have been recorded in the Afrotropics (Winterton and Barraclough 2017). All of the five subfamilies have been recorded from the Afrotropical region, Acrocerinae (8 species), Panopinae (27 species), Philopotinae (16 species), Ogcodinae (10 species) and Cyrtinae (4 species) (Winterton and Barraclough 2017; Gillung and Winterton 2019).

Acroceridae have a distinct morphology, their small heads and large lower calypter are typical, but many species also have an arched thorax and enlarged abdomen. Adults of some genera have elongated mouthparts and can be important pollinators (e.g. *Psilodera* Gray 1832 pollinating *Plectranthus* L'Hér. 1788 (Potgieter et al. 2009) and *Gladiolus brevifolius* Jacq. 1791 (Goldblatt et al. 1997)). Other genera have reduced or absent mouthparts and are assumed not to feed as adults (Schlinger 1981). The frequency with which adults are collected is related to their feeding behaviour, with *Psilodera* the most commonly collected genus in Southern Africa, followed by *Thyllis* Erichson 1840. Genera with reduced mouthparts are comparatively rare in collections. Larvae are obligate parasites of arachnids (Winterton and Barraclough 2017), though host relationships are often not known or are incomplete.

Afrotropical Acroceridae have received comparatively little taxonomic attention in recent years, with only four new species described in the last 40 years (Barraclough 1985, 2001; Winterton and Gillung 2012) and several genera require taxonomic revision (Winterton and Barraclough 2017).

Africaterphis Schlinger 1968 (Philopotinae) is a rarely encountered genus, with only two described species known from only 21 published specimens in collections, distributed across central and southern Africa (Fig. 1). Both known species were described as members of *Terphis* Erichson 1840 (Sabrosky 1950; Schlinger 1960) and moved to *Africaterphis* when it became clear they were not congeneric (Schlinger 1968). Additional notes on sexual dimorphism in the genus were provided by Barraclough (1984), but in the following 40 years there have been no additional publications on the genus. Adults have been collected by hand and in Malaise traps, but no information is known about their biology or host preferences. We describe a new species in the genus and redescribe the known species, provide the first colour photographs of two species and an updated key for the genus.

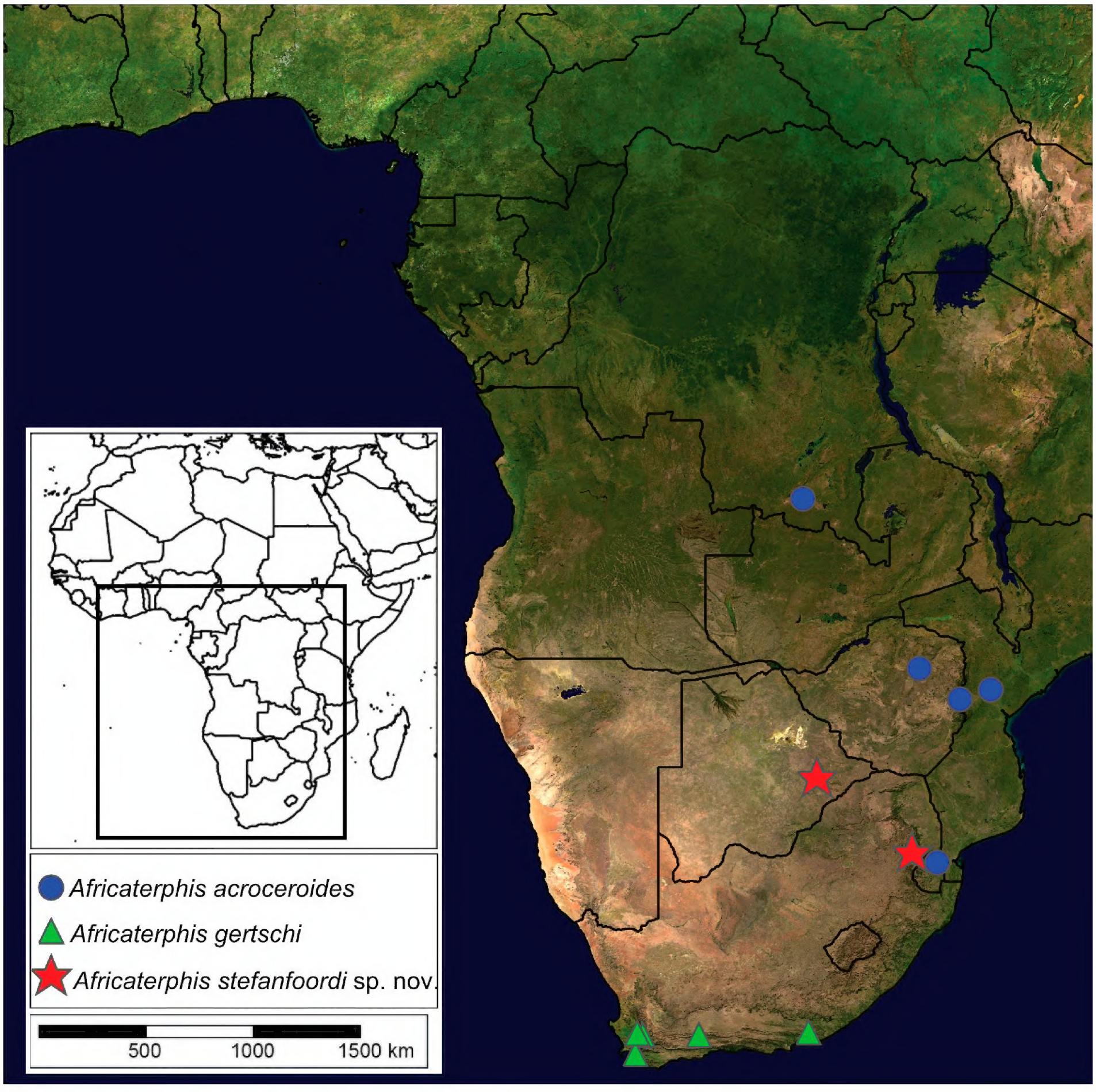


Figure 1. Map of the distribution of *Africaterphis* species.

Materials and methods

Specimens or photographs were obtained from the following institutions:

AMGS	Albany Museum, Makhanda (formerly Grahamstown), South Africa
BMSA	National Museum, Bloemfontein, South Africa
NHMUK	Natural History Museum, London, UK
NMSA	KwaZulu-Natal Museum, Pietermaritzburg, South Africa
SAMC	Iziko South African Museum, Cape Town, South Africa
SUEC	Stellenbosch University Entomology Collection, Stellenbosch, South Africa
USNM	United States National Museum, Washington D.C., U.S.A

Terminology follows Cumming and Wood (2017) and Winterton and Barraclough (2017). Morphological observations were made using a Leica M80 binocular microscope. Body and wing lengths are given as the minimum and maximum observed in the studied material. Body length was measured along the dorsum, from the antennal prominence to the apex of the scutum and from the apex of the scutum to the posterior of tergite 6. Wing length was measured from the tegula to the apex of the wing. Photographs were taken using a modified version of the system described by Brecko et al. (2014), stacked using Helicon Focus 8 and edited in Photoshop 24.0.0. The distribution map was created in SimpleMappr (Shorthouse 2010) and edited in Photoshop 24.0.0.

Results

Taxonomy

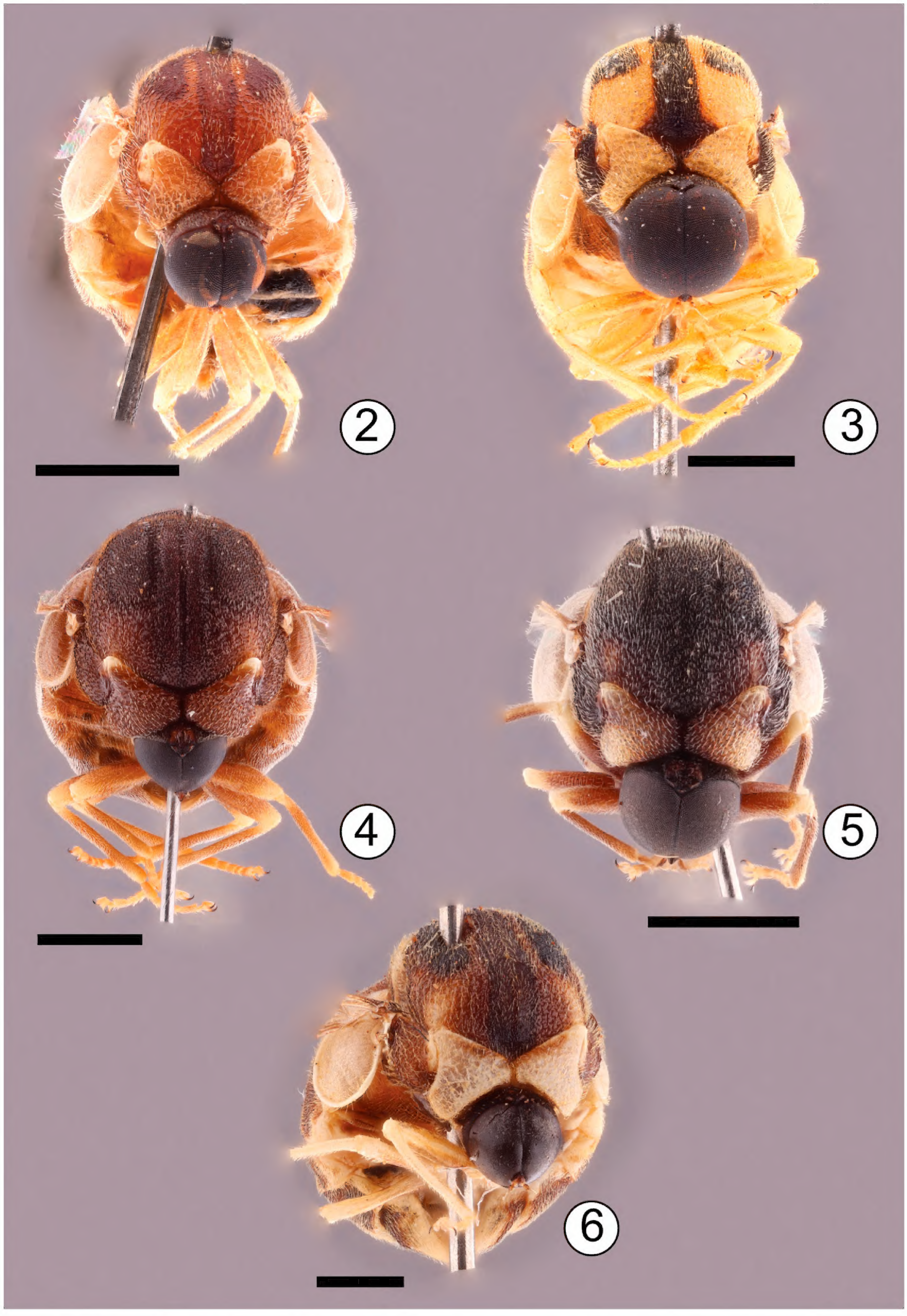
***Africaterphis* Schlinger, 1968**
Figs 2–16

Africaterphis Schlinger, 1968: 61. — Barraclough (1984: 54); Gillung and Winterton (2011: 25). Type species: *Terphis acroceroides* Sabrosky, 1950: 50 (by original designation).
Terphis sensu Sabrosky 1950: 48. Schlinger (1960: 496).

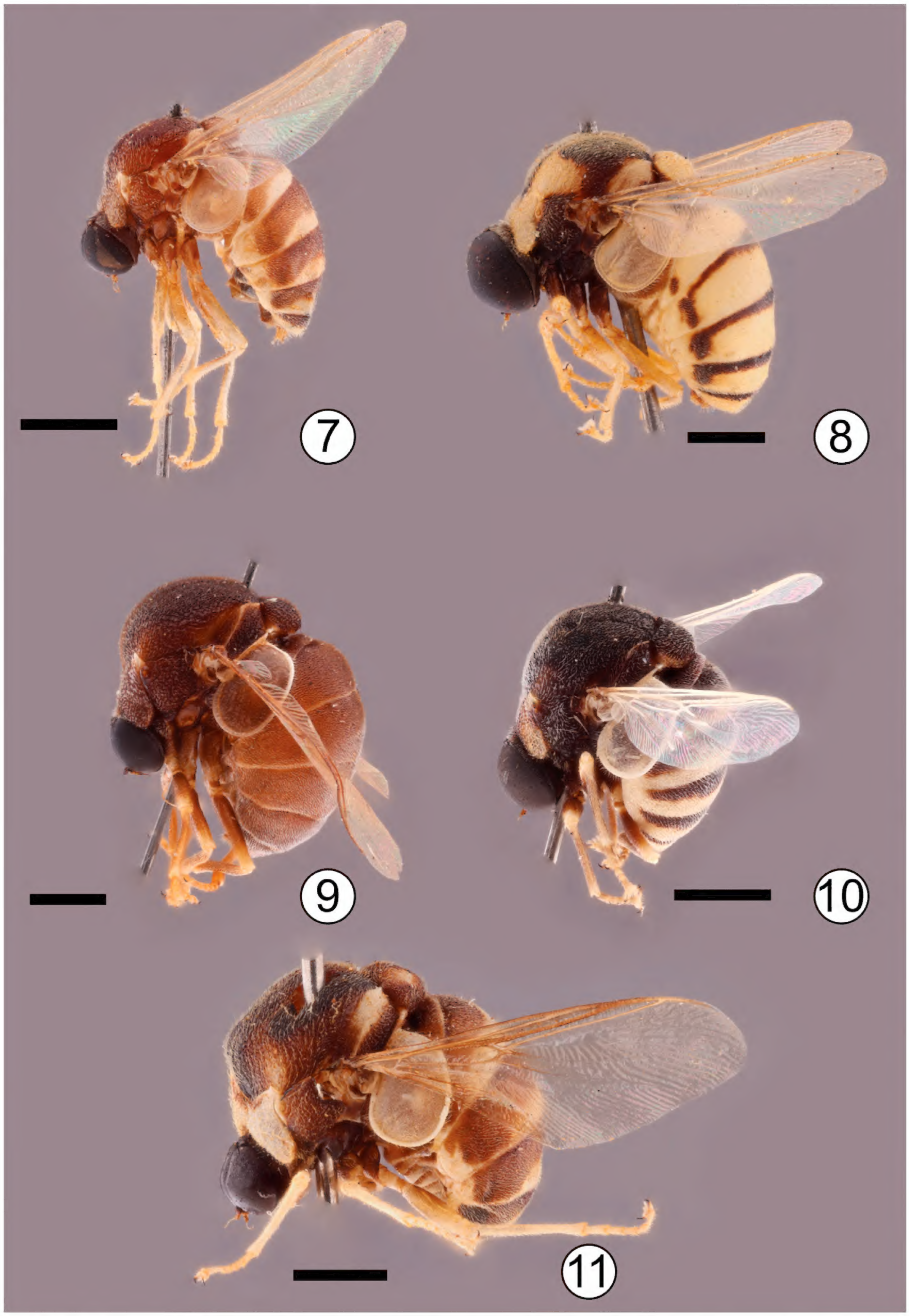
Diagnosis. *Africaterphis* can most easily be distinguished from other Philopotinae by their bare eyes; highly reduced wing venation; globose abdomen; and postpronotal lobes being proximate but not abutted medially, body coloration drab (not metallic); eyes contiguous above and below antennal base; antennae placed on lower part of head, adjacent to mouthparts; flagellum stylate; legs not elongated; abdominal tergites smooth, rounded in lateral view.

Comments. *Africaterphis* contains three valid species. While *A. gertschi* appears to be limited to the winter rainfall region of South Africa, *A. acroceroides* and *A. stefanfoordi* sp. nov. occur in the summer rainfall areas and are not as well separated geographically (Fig. 1).

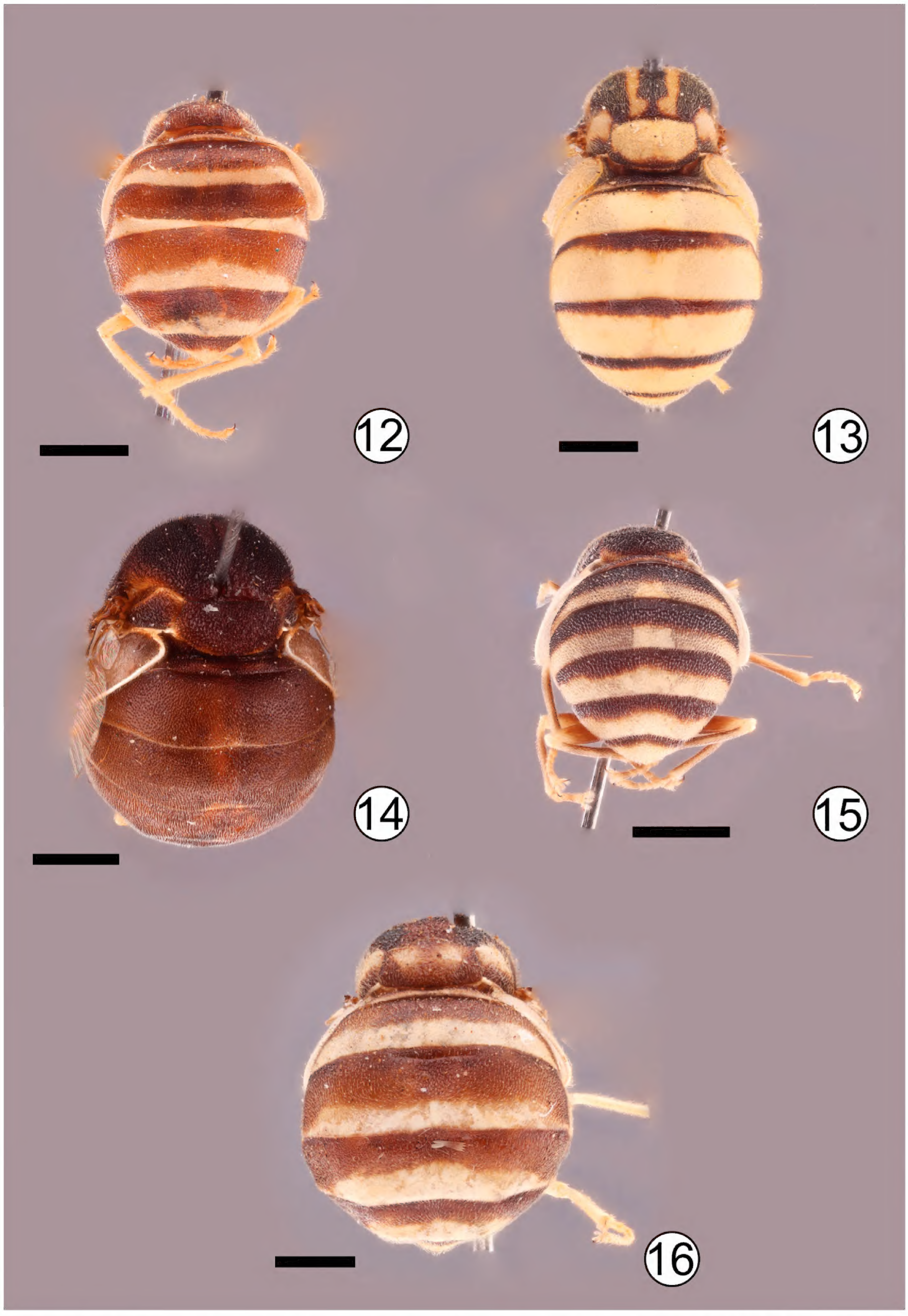
Species included. *Africaterphis acroceroides* (Sabrosky 1950), *Africaterphis gertschi* (Schlinger 1960), *Africaterphis stefanfoordi* sp. nov.



Figures 2–6. Frontal view of *Africaterphis* species **2** *Africaterphis acroceroides* female **3** *Africaterphis acroceroides* male **4** *Africaterphis gertschi* female **5** *Africaterphis gertschi* male **6** *Africaterphis stefanfoordi* sp. nov. female. Scale bars: 1 mm.



Figures 7–11. Lateral view of *Africaterphis* species **7** *Africaterphis acroceroides* female **8** *Africaterphis acroceroides* male **9** *Africaterphis gertschi* female **10** *Africaterphis gertschi* male **11** *Africaterphis stefanfoordi* sp. nov. female. Scale bars: 1 mm.



Figures 12–16. Abdomens of *Africaterphis* species **12** *Africaterphis acroceroides* female **13** *Africaterphis acroceroides* male **14** *Africaterphis gertschi* female **15** *Africaterphis gertschi* male **16** *Africaterphis stefanfoordi* sp. nov. female. Scale bars: 1 mm.

Key to species

1 Sternites yellow, without brown fasciae. (males)....**2**
– Sternites with at least some brown (females) **3**
2 Median ocellus present; scutum mostly black, with small white to yellowish white patterns; scutellum black centrally, transitioning to brown then with a yellow border; legs with coxae, central ¾ of femora and tarsi brown; wing veins white, except brown basally....***A. gertschi***
– Median ocellus absent; scutum mostly yellow, with black fasciae; scutellum mostly yellow, with small basal black macula and black border, legs yellow except for brown coxae; wing veins entirely brown .... ***A. acroceroides***
3 Median ocellus absent; sternites bicoloured, yellow with brown fasciae anteriorly; scutellum brown with yellow maculae ..... ***A. stefanfoordi* sp. nov.**
– Median ocellus present or absent; sternites entirely brown; scutellum brown, laterally paler but not yellow....**4**
4 Median ocellus absent; postpronotal lobes entirely brown; abdomen with yellow fasciae; lower calypter yellowish white....***A. acroceroides***
– Median ocellus present; postpronotal lobes brown with a small pale macula posteriorly; abdomen brown; lower calypter brown....***A. gertschi***

Species accounts

***Africaterphis acroceroides* (Sabrosky, 1950)**
Figs 2, 3, 7, 8, 12, 13

Terphis acroceroides Sabrosky, 1950: 50 – Schlinger (1960: 497).
Africaterphis acroceroides (Sabrosky 1950: 50) – Schlinger 1968: 62; Schlinger 1980: 378; Barraclough 1984: 56.

Material examined. ***Holotype*** (Photographs only). Democratic Republic of the Congo • ♂; Katanga Province, Tenke; 30 Jul.– 9 Aug. 1931; Miss A. Mackie leg.; BMNH(E) #241481; NHMUK013444824; NHMUK

***Paratype*.** Democratic Republic of the Congo • ♂; Katanga Province, Tenke; 30 Jul.– 9 Aug. 1931; Miss A. Mackie leg.; BMNH(E) #241481; USNMENT01842970; USNM.

Other material. Eswatini • 1♂; Mhlume; 26°00'S, 31°65'E; 200 m asl; 18 Aug. 1983; Swept in dry grass; NMSA-Dip 0000006; NMSA.

Mozambique • 1♀; Ville Paiva d'Andrada; Sept 1957; B.R. Stuckenberg leg.; Taken from Gallery forest; NMSA-Dip 000007; NMSA.

Zimbabwe • 1♂; Bomponi, Vumba; 16 May 1965; D.M. Cookson leg.; NMSA-Dip 000010; NMSA • 1♂ same data as preceding; 24 May 1965; NMSA-Dip 000008 • 4♂♂; Eastern Vumba; 6 May 1965; D.M. Cookson leg.; NMSA-Dip 000009, 142294–6; NMSA • 1♀; Harare [as Salisbury]; 23 Jul. 1965; I.L. Bissett leg.; AMGS-ENT 57645; AMGS.

Diagnosis. *Africaterphis acroceroides* can be distinguished from the known species in the genus by the combination of yellow anterior half of the postpronotal lobes in males; brown anterior half of the postpronotal lobes in females (brown in female *A. gertschi*; yellow and brown in male *A. gertschi* and yellow in female *A. stefanfoordi* sp. nov.) and predominantly yellow scutum with black

dorsal fasciae in males; brown with darker brown dorsal fasciae in females (predominantly black in *A. gertschi* and predominantly brown in *A. stefanfoordi* sp. nov.).

Description. Male. Length of entire specimen 5.5–6.7 mm, wing length 4–4.3 mm.

Head black, spherical, eyes contiguous above and below antennae. Antennae brown, minute; segment 1 hardly discernible under antennal tubercle; segment 2 short, round, pollinose; segment 3 shiny, not pollinose, round basally with large sensorial pits, with a straight, short, broad style arising dorso-apically at apex; style with one apical setae. Small, triangular area below antennae without eye facets. Antennal tubercle shiny, bluntly pointed, extending to the base of antennal segment 3; bare. Ocelli brown, on raised triangle; median ocellus absent; lateral ocelli large, oval, 2 times wider than long, not touching eye margin. Vertical depression rugose. Occiput smooth laterally and dorsally, slightly sculptured above on posterior margin, with bristle like pile dorsally. Mouthparts visible, reduced, without surrounding small raised lip.

Thorax rugose, more so on pale areas, with short white pile over entire surface. Scutum yellow, with three dorsal black markings. Central fascia arrow shaped, broad between postpronotal lobes, tapering strongly then approximately parallel sided, with small triangular constrictions just before the posterior margin. Postero-lateral maculae large, quadrilateral, black; narrowest at scutellar margin, medial margin parallel to central fascia, broadest in line with wing base. Dark fascia sometimes present below posterior calli. Strongly arched, slightly depressed on yellow parts. Scutellum yellow, except for a small basal black macula and margin. Postpronotal lobes yellowish-white, contiguous for about as long as length of ocellar triangle, with a small brown spot on postero-medial angle. Pleurites brown, yellow around prothoracic spiracle. Anepisternum and meron swollen; less rugose than scutum.

Legs pale yellow, except for pale brown coxa; with yellow pile.

Wings pale white, almost hyaline, except narrowly brown at base. Wing veins pale brown; well-developed anteriorly, reduced medially and absent posteriorly. Lower calypter yellowish-white with darker yellow border, broadly connected to thorax along half of antero-dorsal margin. Halter stem and knob dark yellow.

Abdomen densely punctured, longer than thorax, widest at segment 3, segments 1 narrower than segment 5; tergite 1 short, but prominently raised; tergites 4 to 6 fold over ventrally. With short appressed white pile over the entire surface, longer posteriorly. Tergite 1 dark brown, with thin yellow fascia on the posterior margin. Other tergites yellow with dark brown fasciae on anterior margin, broader centrally on tergites 2 and 3, occupying ⅛ to ⅓ of tergites 2 to 3 and ⅙ to ¼ of tergites 4 to 6. Sternites yellow. Genitalia small, brown.

Female as for male except:

Length of entire specimen 4.4–5.5 mm., wing length 3.1–4.0 mm.

Head: Mouthparts not visible, reduced, without surrounding small raised lip.

Thorax with short brown pile over entire surface. Scutum brown, with dorsal darker brown markings. Posterior calli yellow. Strongly arched, slightly depressed on light brown parts. Scutellum brown, paler brown centrally. Postpronotal lobes brown.

Wings: Lower calypter yellowish-white on surface and border. Halter stem and knob dark pale brown.

Abdomen: Tergite 1 brown, with thin pale brown fascia on the posterior margin. Other tergites yellow with brown fasciae on anterior margin, not broader centrally, ¼ of tergites 2 to 6. Sternites brown.

Comments. The males of *A. acroceroides* are easily identified by their striking yellow and black colour patterns. This species has the widest known distribution in the genus (Fig. 1), ranging from the Democratic Republic of the Congo to Eswatini, though all collecting sites are in woodlands or forests.

***Africaterphis gertschi* (Schlinger, 1960)**
Figs 4, 5, 9, 10, 14, 15

Terphis gertschi Schlinger 1960: 497.
Africaterphis gertschi (Schlinger 1960: 497) – Schlinger (1968: 62); Schlinger (1980: 378); Barraclough (1984: 56).

Material examined. ***Holotype*** (photographs only). South Africa • ♂; Western Cape [as Cape Province], Ceres; 1500 ft asl; 1–3 Jan. 1921; R.E. Turner leg.; BMNH(E) 241282; NHMUK 013444825; NHMUK.

***Paratype*.** South Africa • 1♂; Western Cape, Ceres, Matroosberg; 3500ft; Nov. 1917; Lightfoot leg.; SAM-DIP A009073; SAMC.

Other material. South Africa • 2 ♂♂ 3♀♀; Eastern Cape [as Cape Province], Makhanda [as Grahamstown], Hilton; 13–30 Nov. 1970; FW Gess leg.; Malaise trap; AMGS-ENT 57341, AMGS-ENT 57342, AMGS-ENT 57344, AMGS-ENT37346, AMGS-ENT 57347; AMGS • 1 ♂; same data as preceding; 5–9 Nov. 1970; AMGS-ENT 57338; AMGS • 1 ♂; same data as preceding; 28–30 Oct. 1970; AMGS-ENT 57340' • 1 ♀; same data as preceding; 1–16 Jan. 1971; AMGS-ENT 57345; AMGS • 1 ♀; same data as preceding; 8–12 Oct. 1975; AMGS-ENT 57343; AMGS • 1 ♂; same data as preceding; 22–26 Oct. 1975; AMGS-ENT 57339; AMGS • 1 ♂; same data as preceding; 5–9 Nov. 1975; NMSA-Dip 000011; NMSA • 1 ♀; same data as preceding; 5–7 Dec. 1977; NMSA-Dip 000012; NMSA • 2 ♂♂ Western Cape, Gamkaskloof, Die Hel; 33°21.808'S, 21°37.650'E; 16–18 Oct. 2012; 336 m; AH Kirk-Spriggs leg.; BMSA (D) 38528, BMSA (D) 38529; BMSA • 1 ♂; Western Cape, Grabouw; 6 Jan. 1971; J.G. Theron leg.; SUEC • 1 ♀; Western Cape [as Cape], Nuwekloof, 3 km E. Gouda; 33°19'S, 19°06'E; 5 Oct. 1993; J.G.H Londt leg.; old road and riverbanks; NMSA-Dip 000316; NMSA.

Diagnosis. *Africaterphis gertschi* can be distinguished from the known species in the genus by the combination of brown anterior half of the postpronotal lobes in the case of females and yellow and brown in the case of males (brown in female *A. acroceroides* and yellow in female *A. stefanfoordi* sp. nov.) and predominantly black scutum (yellow with black fasciae in male *A. acroceroides* and predominantly brown in *A. stefanfoordi* sp. nov.).

Description. Male. Length of entire specimen 4.5–6.6 mm., wing length 2.9–3.7 mm.

Head black, spherical, eyes contiguous above and below antennae. Antennae brown, minute; segment 1 hardly discernible under antennal tubercle; segment 2 short, round, pollinose; segment 3 shiny, not pollinose, broad and round basally with large sensorial pits, with a straight, short, broad style arising dorsally at apex; style with four short apical setae. Small, triangular area below

antennae without eye facets. Antennal tubercle shiny, longitudinally ridged, flat below, with acute median tip extending out beyond base of antennal segment 3; with several scattered long setae. Ocelli brown, on broad triangle; median ocellus small, circular; lateral ocelli large, oval, 2 times wider than long, touching eye margin. Vertical depression and surrounding ridge rugose. Occiput smooth laterally, sculptured above on posterior margin, with bristle like pile posteriorly. Mouthparts not visible, area surrounded by small raised lip.

Thorax rugose, with short white pile over entire surface. Scutum mostly black, with yellowish white spots posterior to the postpronotal lobes, brown on dorsal ridge of postalar callus, usually with a yellowish brown spot posterior to postalar callus, which ranges from small and rounded to larger and more triangular. Strongly arched, with three deep but narrow longitudinal grooves, the medial one running the entire length of the scutum, the lateral grooves running from in line with the postpronotal lobes to in line with the postalar calli. Scutellum black centrally, with brown areas laterally as it transitions to yellow posterior border. Postpronotal lobes mostly yellowish-white, contiguous for about as long as length of ocellar triangle, with a small brown spot next to the prothoracic spiracle. Pleurites black, but with brown spots surrounding prothoracic spiracle and ventral of the postpronotal lobes. Anepisternum and meron swollen; katepisternum and upper part of postalar callus no rugose.

Legs pale yellow, except for the coxae and central 3/4 of the femur which are brown and tarsi which are sometimes pale brown; with yellow pile.

Wings pale white, almost hyaline, except narrowly brown at base. Wing veins white, except brown at base; veins well developed anteriorly, reduced medially and absent posteriorly. Lower calypter white with white border, broadly connected to thorax along half or antero-dorsal margin. Halter stem brown, knob yellowish brown.

Abdomen densely punctured, as long as thorax, widest at segment 3, segments 1 and 5 of equal width; tergites 2 to 4 with deep groove anteriorly which fits under the preceding tergite, tergite 1 short, but prominently raised; tergites 4 to 6 fold over ventrally. With short appressed white pile over the entire surface. Tergite 1 black, with thin yellow fascia on posterior margin. Other tergites yellow with black fasciae on anterior margin, occupying ½ to ²/₃ of tergite 2, ¹/₃ to ³/₅ of tergite 3 and ¹/₁₀ to ½ of tergites 4 to 6. Sternites yellow. Genitalia small, brown.

Female as for male except:

Length of entire specimen 6.0–6.4 mm., wing length 3.9–4.5 mm.

Head. Lateral ocelli 3 times as long as wide. Mouthparts reduced, yellow, area surrounded by small raised lip.

Thorax: Scutum mostly dark brown, lighter brown laterally. Longitudinal grooves shallower. Scutellum brown, slightly lighter on basal corners. Postpronotal lobes brown, except for a small yellow spot near the posterior border. Pleurites brown.

Legs brown, except for the tip of the femur and dorsal side of tarsi, which are yellow.

Wings faintly brown infuscated. Wing veins brown. Lower calypter brown, rim brown except for medial angle where it is whitish.

Abdomen, longer than thorax, widest at segment 4, segments 1 and 6 of equal width; tergites 2 and 3 with shallow groove anteriorly. Tergites and sternites brown.

Comments. Found in Fynbos and Thicket vegetation in the Western and Eastern Cape provinces of South Africa (Fig. 1). Unlike the other known species, *A. gertschi* is limited to the winter rainfall region.

***Africaterphis stefanfoordi* sp. nov.**

https://zoobank.org/249140FD-80ED-4DF4-9267-F6B6EDF391F8

Figs 6, 11, 16

Material examined. *Holotype*. Botswana • ♀; Serowe; 3 Sept. 1983; P. Forchhammer leg.; NMSA-Dip 142325; NMSA.

***Paratype*.** South Africa • 1♀; Mpumalanga, Kaapmuiden; 25°32'S, 31°19'E; Apr. 1967; J.E.P. leg.; NMSA-Dip 142324; NMSA.

Diagnosis. *Africaterphis stefanfoordi* sp. nov. can be distinguished from the known species in the genus by the combination of yellow anterior half of the postpronotal lobes (brown in female *A. gertschi* and *A. acroceroides*; yellow and brown in male *A. gertschi*) and predominantly brown scutum (yellow with black fasciae in male *A. acroceroides*).

Description. Female. Length of entire specimen 7.6–8.8 mm., wing length 6.1–6.8 mm.

Head black, spherical, eyes contiguous above and below antennae. Antennae brown, minute; segment 1 hardly discernible under antennal tubercle; segment 2 short, round, pollinose; segment 3 shiny, not pollinose, broad and oval basally with large sensorial pits, with a straight, short, broad style arising dorsally at apex; style without apical setae. Small, triangular area below antennae without eye facets. Antennal tubercle broader than high, shiny, flat below, with rounded tip extending to base of antennal segment 3; with several scattered long setae. Ocelli brown, on small, raised triangle; median ocellus absent; lateral ocelli large, oval, 2 times wider than long, not touching eye margin. Vertical depression and surrounding ridge faintly rugose. Occiput smooth laterally, sculptured above on posterior margin, with bristle like pile laterally. Mouthparts reduced, yellow.

Thorax rugose, with short light brown pile over entire surface. Scutum mostly brown, with yellowish white spots posterior to the postpronotal lobes and on the postalar callus, medial vitta dark brown, lateral maculae black. Strongly arched, with three narrow longitudinal grooves, the medial one short and shallow, starting after the postpronotal lobes and stopping in line with the wings, the lateral grooves running from just behind the postpronotal lobes to in line with the postalar calli. Scutellum brown centrally, with two yellow maculae medio-laterally and dark brown laterally; with dark brown posterior border. Postpronotal lobes mostly yellowish-white, contiguous for about as long as length of ocellar triangle, brown on medial part of the posterior border. Pleurites brown, but with a yellow macula surrounding prothoracic spiracle. Anepisternum and meron swollen; katepisternum less rugose.

Legs pale yellow, except for the coxae are brown; with yellow pile.

Wings pale white, almost hyaline, except narrowly brown at base. Wing veins brown; veins well developed anteriorly, reduced medially and absent posteriorly. Lower calypter white with white border, broadly connected to thorax along half or antero-dorsal margin. Halter stem and knob yellowish brown.

Abdomen densely punctured, as long as thorax, widest at join of segment 3 and 4, segment 1 slightly narrower than segment 5; tergite 1 short, but prominently raised; tergites 4 to 6 fold over ventrally. With short appressed pale yellow pile over the entire surface, longer posteriorly. Tergite 1 dark brown, with thin yellow fascia on posterior margin. Other tergites brown with yellow fasciae on posterior margin, occupying ⅓ of tergite 2, ¼ of tergite 3, ½ of tergite 4 to 6. Sternites yellow, with narrow brown fascia anteriorly. Genitalia small, brown.

Male. Unknown.

Etymology. We name this species in honour of Stefan Foord in recognition of his contribution to Entomology, Arachnology and Zoology in South Africa, Africa and the World. Stefan was a great colleague and friend and we miss his presence in the world.

Comments. The known sites for *A. stefanfoordi* sp. nov. are in scrubland, rather than the woodland and forests from which *A. acroceroides* are known. While both species occur in the summer rainfall region, *A. stefanfoordi* sp. nov. occurs in drier habitats.

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We thank Erica McAlister for providing photographs of the holotypes of *A. acroceroides* and *A. gertschi* and Simon van Noort (SAMC), Aisha Mayekiso (SAMC), Burgert Muller (BMSA), Pia Addison (SUEC), Torsten Dikow (USNM) and Terence Bellingan (AMGS) for the loan of specimens. We thank Shaun Winterton for his valuable comments on the manuscript.

Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statement

No ethical statement was reported.

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Author contributions

Both authors were involved in project development. JM wrote the first draft, GT commented on the draft.

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Data availability

All of the data that support the findings of this study are available in the main text.

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